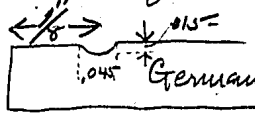
Notebook Series -- Notebooks by Experimenters Other Than Edison
Phonograph Record Experiments -- W. W. Dinwiddie Disc Books
Notebook, N-18-04-30

This notebook was used by William W. Dinwiddie during April-July 1918 for notes relating to the production of the blanks and submasters used in the manufacture of disc records. Edison's supervision of this work is indicated by Dinwiddie's references to his suggestions and by lists of chemicals referred to as "Mr. Edison's." The experiments are numbered from D1 through D100. The entries indicate differing methods of preparation involving variations in the baking schedules and the use of different ingredients, combinations of ingredients, and varnishes. Most entries contain comments about the results of the experiments, including whether the disk was cracked, rough, too stiff, or stuck to plates and molds during printing process. Also included are references to varnish experiments and to "drop tests" that were performed to determine the durability of the experimental blanks and submasters. There are occasional lists of chemicals ("materials obtained in N.Y."), along with notations regarding their characteristics and sources of supply. The notes indicate that Frank Clancy, Charles T. Dally, Charles G. Kircher, and Ludwig F. (Louis) Ott worked with Dinwiddie on these or related experiments. The front cover is labeled "Dinwiddie D-1 — 100" and "Disc Records." The pages are unnumbered. Approximately 110 pages have been used.

II-1 for Wm Clancy

Plate in mould for sticking on the first sheet of celluloid submaster.



Sticks on one sheet celluloid with this plate - using regular schedule Send with plate to Dimroddie in Building 4.

II-2 Make a regular celluloid submaster with the blanks prepared as D-1 6 small gaps are cut in the ridge to prevent trapping air — Printed with vacuum, WWD.

Print showed full- small blister near the center hole. edge seemed to be a little low.

April 30-1918-

H-3 Submaster blank varnished with 1841-E varnish and two layers of blotting paper with 1841-E varnish applied to each side. Air dried and a second coat of varnish applied to top surface - Baked 1933-E Schedule. (Blister near center) Revarnished May 1-18 - Baked again 1933-E Stuck to transfer plate and split the blotting paper —

split

Contact 4-54-30
2000 lbs 4-58
Watman 5-6-30
" off 5-14

[5]

Apr 30-1918

D4 Plants prepared same as D-3 but allowed to stand all night before baking 1933-E schedule - Baked 1933-E.

Treated with "Tanning" solution did not stick to plate - but the plates separated.

Platters start cold

Steam on 1-17 P.M. May 1.

1000 lbs 1-23

Water on 1-29

Off 1-38-30

D-5 Blank prepared same as D-3 but allowed to air dry 24 hours then 2 coats 1841 Varnish & baked 1933-E.

May 2	Steam on	1-55 Pm	100 lbs Steam
	Contact	1-56	
1000 lbs	Hydraulic	2-01	
	Water on	2-04	
	off	2-16	

D-6

Sheet of condensite impregnated fiber made by Diamond State Fibre Co, Bridgeport, Montgomery County, Pa — placed on disc of submarine — start with platters warm

~~Steam on~~ 8 05

1000 lbs 8 09

Watson 8 13

Off 8 22

Looks dirty — cracked around edge would be rough from small lumps of condensite on surface

N. G.

D-7 for Mr Kircher —
printing press schedule —
Contact pressure until thermometer reaches 200°
Hold for 2 minutes more
Then take 2 minutes to come up to
full pressure — Hold full pressure
for 7 minutes then cut it back
slowly (take about a minute) to
contact pressure — This makes 12
minutes after thermometer reaches
200° — Then turn off steam and
cool as usual —
Make one round inspect for
parallel cracks — W.W.D.

12 printed
2 O.K.
10 poor prints — There were no parallel cracks.

See D-12

D-8 for Mr Richer —

Varnish with one coat regular varnish - 12 records which have been discarded for low prints etc but blanks are sound.

Print regular —

all were discards due to trapt air — three cracked across the label and one had a parallel crack. but all had the trapt air spots —

May 3-18

D-9

Place disc of blotting paper on a submaster blank - Varnish with 2 min viscosity 1841-E Varnish before any shims or gum blank has been added, Put on varnish until it soaks completely thru the blotter and sticks it to the blank — Air dry and lay on another disc of blotting paper and apply varnish as before — Air dry one hour then apply one coat regular 1841-E Varnish 5 min viscosity Bake 1933-E

May 4 - Stokingan press
Steaman 11 - 03
Contact 11 - 04 —
1000lls 11 - 10 - 30
Cwater on 11 - 15 - 30

D-10

Same as D-9 except use only one thickness of paper

May 4 Stitching on press - Press cold

Steamon 11-33-0

Contact 11-34-0

1000lbs 11-37

Meltoon 11-4F

Off 11-5F

D-11 For Mr Clancy.

Same plate as II-1 but width and depth of groove increased 50%

Stick on one sheet of celluloid with this plate- using regular schedule- send with plate to Building 4 — W.D.

D-12 For Mr Kirchner — Make 12 prints
Printing press schedule —
Contact pressure until thermometer reaches 200°
Hold for 2 minutes more —
Then take 2 minutes to come up to full pressure —
Hold full pressure for 9 minutes then take about a minute to get back to contact pressure like D-7 — This makes 14 minutes steam after thermometer reaches 200°
Turn off steam and cool as usual —

all poor prints —
also some cracked across label
3 radial cracks

May 3

D-13 two sheets blotting paper soaked with same 2 min viscosity varnish as used in D-9 – Hung up to dry exposed to air on both sides – dry for 24 hours – Then laid on submaster blank

Steam on 2-46-30
Contact 2-49-30 Could get only 50 lbs steam
1000 lbs. 2-53-30
Water on 3-3-30
Off 3-12-30

D-14-

250 g - shellac.
50 g - cotton floc.
325 g china clay } mixed together -
325 g Kisselguhr }
50 g gas black.

Could not get in more than half of the china clay and Kisselguhr - I estimated 150 g of each.

250 g shellac
50 g cotton floc
50 g gas black
300 g filler
650 g

about 40% shellac

650) 250 (38 1/2 % shellac
1950
5500
5200
300
260
40

D-15 12 g. gas black 1 ± %
50 g. cotton floc. 6 ± %
250 g. T.N. Lac 33 ± %
433 g. china clay 58 ± %
744 g. 100 %

I believe that by using a little less floc that we can get the lac down to 30%
See D-16

D-16

300 g. T. N. Lac.
25 g. cotton floc.
15 g. gas black.
660 g. china clay

Could only get in 516 g. clay

This makes the TN only 35%

(31)

D-17

250 g. T. N. Lac	25%
50 g. Rosin I grade	5%
20 g. Cotton flbe	2%
10 g. Coas black	1%
670 g. China clay	67%
	100%

This was comparatively little trouble to work - took the china clay without diffjculty. The greater fluidity and stickyness of the rosin makes it take more filler.

D-18

300 g.	T. N. Lac –	30%
20 g.	cotton floc –	2%
10 g.	gas black –	1%
670 g.	china clay.	67%

When rolls are running when 3/4 of the china clay has been added put a little denatured alcohol on the rolls now and then. to help work in the china clay. This suggested by Mr. Edison.

This worked O.K. but is not as good as the resin D-17

D-19

200 g	shellac	20%
100 g	Rosin	10%
20 g	Cotton floc	2%
10 g	gas black	1%
670 g	china clay	67%

D-20

Took D-17 and laid it on the hot rolls covered with a newspaper for about 20 minutes and rolled it over without any difficulty, —

✓ alcohol too volatile
✓ Benzole " "
✓ Acetone " "
✓ Glycerine not a solvent -
✓ naphthalene no marked effect — possibly slight *
✓ Tetra chloronaphthaline not a solvent.
✓ Venice Turpentine
✓ Copaiba Balsam
✓ Turpentine
✓ Rosin oil
✓ Linseed oil
✓ Carbon Tetra chloride too volatile.
✓ Camphor
✓ Kerosene
✓ Palmitic acid
✓ Stearic acid *

D-21

Small Samples of D-17 laid on rolls - three at a time and a few drops of various solvents added when rolling - I see ing any of them improves the consistency of the ~~mixture~~ mixture.

Stearic acid stops stickyness and naphthalene also tends lower the melting point, but comes the stickyness introduced by the addition of Rosin

D-22

225g T.N. Lac
500g I. Rosin,
25g Venice Turpentine.
20g cotton floc.
10g gas black.
670g china clay.

D-23

200g T.N. Lac
50g I Rosin
50g Venice Turpentine
20g cotton floc
1.0g gas black
670g China clay

D-24

250 g.	T.N. Lac.	25%
50 g.	I. Rosin.	5%
(25 g.	Naphthalene.)	(extra 2½%)
20 g.	cotton floc.	2%
10 g.	gas black.	1%
670 g.	china clay.	67%
		102½%

Probably a large part of this is lost

D-25

Regular mix for powder blanks

220	Rosin	11%
40	gas black	2%
1080	wood	54%
660	chalk	33%
		100%

Put Rosin on rolls - then wood - Chalk - and gasblack - Run until it ground up to powder - then put stem hand coffee mill to break up the flakes - made one blank - looks coarse from the coarse powder but seems to be well mixed

Varnished 2 coats 5min visc

1841-E baked 1933-E

Print OK, but rough surface due to unground powder -

Drop test broke on 2d drop but seems to be about ~~as strong~~ as the regular -

D-26 –

Mixed all that was left of D17-20-22-23-24 and put on rolls and reheated like D,20 worked up into a gob and printed on moulds above 150° F made a submaster about an inch thick – material was too stiff and showed considerable deflota due to form of gob – 1000 lbs pressure used –

CSI

D-27 Same mix as D-24
gob folded up by hand and
moulded — about 9/16 thick
Made on O.K. record

Record weighs 937 grammes net
Scrap found 42
979

D-28

250 g T. N. Rac
50 g I. Rosin
25 g Napthalene
20 g Cotton floc,
10 g gas bladder
485 g Kisselghur
860 g

This is all that I could get in and the mix was then more dry than D-24

The Kisselghur is very much more bulky than the china clay but when in the mix it does not seem to make the mix more bulky

Specific Gravity determined by L. Ott 1.389+

China clay mix No 24 determined same time by L. Ott 1.752+

Print was N.G. too stiff to fill with 1000 lbs pressure - flowing badly rubbed the mould.

D-28

250 g T. N. Lac
50 g I. Rosin
25 g Napthaline
20 g Cotton floc,
10 g gas bladder
485 g Kisselghur
860 g

This is all that I could get in and the mix was then more dry than D-24

The Kisselghur is very much more bulky than the china clay but when in the mix it does not seem to make the mix more bulky

Specific Gravity determined by L. Ott 1.389+

China clay mix No 24 determined same time by L. Ott 1.752+

Print was N. G. too stiff to fill with 1000 lbs pressure - flowing badly rubbed the mould.

D-29 - Press Schedule Experiment.
Run one press with 11 moulds and one dummy in the top space, dummy about ½ inch thinner than a pair of moulds,
Make contact just lifting the 12th platten leaving an air space over the dummmy,
Run 2-2-10 schedule
and 2-3-9 "
If this does not give low prints it will save the moulds;
with contact pressure of 100 lbs the top mould has 10 000 lbs to support and bottom mould 10,800 or more—

D-30, same proportions as D-24 but 10% greater quantity,

275 g T. N.
55 g I. Rosin.
27½ g Naphthalene.
22 g cotton flock.
11 g gas black.
737 g china clay
1127½ g.

Took 15 minutes from time starting rolls to get in press under 1000 lbs pressure —
Print O.K.

D-31

275 g T. N.
55 g I Rosin -
55 g Naphthalene
22 g cotton floc
11 g gas black
737 g china clay
1155 g total.

double amount in 24
10% larger quantity made -

D-32-

Same as D-31 but did not have quite enough to fill the mould used a slightly larger ring.

D-33 - Same mix as D-31
Printed on a master mould that was very dirty - Clancy said that printing it once would take the dirt off, but it seemed to get worse - phlight sounds very cracky and surface is only fair.

D-34 -

413 g TN, same proportion as D-24
83 g I Rosin.
83 g Naphthaline.
33 g cotton flock.
17 g gas black.
1105 g china clay.

Rolled to 1/4" thick then cut out a circle with knife sheet of dope laid on board and marked with ring die.

Back of mould convex 1/16 inch to get the air out, Centre touches first - makes a record concave on the back.

A seam in the gob shows on the print - But surface is otherwise good and mechanically O.K.

D-35

Same as D-34 except that only 55 g naphthaline was used. Same defect as D-34 but not quite so bad – Rolled so thin that there was no surplus to squeeze out".

D-36

Same as 31 except that cotton floc used was degreased and prepared for smokeless powder - clean and free from cotton seed hull -

Surface very much better & free from cracks -

Did not make a disc gob - folded up by hand like 31 ~~but~~ but used the convex back.

D-37 5/22/18

300g T.N.
50g I. Rosin.
40g Cottonflock.
20g gas black.
590g china clay.
1000g. Total

No Napthalene used
More T.N.
More cotton floc – good quality.
More gas black –
Moulded like D-36 – surface shows effect of a seam in the gob, making cracklers – next morning both D-37 and 36 show less deformation than records previously made with low grade floc. D37 shows some "air swellings" same D36.

5/23/18

D-38 350 g TN
25 g I Rosin
10 g Cotton floc
10 g gas black
655 g china clay
1050 g total,

very soft -
Had mould colder than usual to prevent sticking as gob was very sticky.
Made reddish mottled print. looked like copper oxide attack on print in the mottles - with supplementary mottles on mould. surface not quite as good as D-36 - but free from crackles. Microscope shows that mould was too cold to allow print to close up perfectly.

D-39 250 g. T.N.
50 g. I Rosin
20 g Naphthalene
10 g gas black.
670 g china clay.

Omission of cotton floc makes the material very much more smooth.

Mould was too hot - stuck & broke

start { water overflow 172° / in Tank 142° } 9 22 Am — Fahrenheit

overflow 136 / tank 139 } 9 30

134 / 137 } 9 46

132 / 135 } 9 53

100 / 133 } 10 04

6° in 29 min

Room Temperature 75° F

Reheated 146° / 149° } at 10 21

8° in 32 min

138 / 141 } at 10 53

5° in 28 min

132 / 135 } 11 21

2 1/2° in 8 min

129 1/2 / 132 } 11 39

11 1/2° in 86 min

118° / 119 1/2 } 1 05 Pm

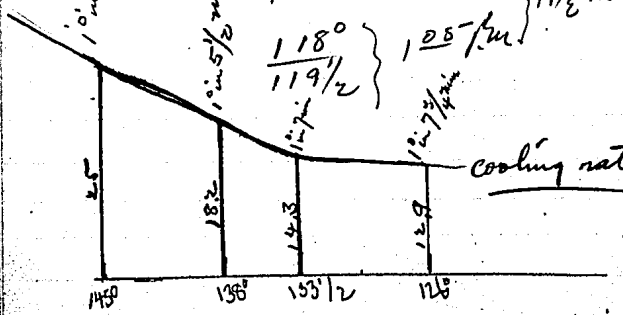
1° in 4 min

1° in 5 1/2 min

1° in 7 min

1° in 7 3/4 min

cooling rate



D-40

Circulating water in Reas from tank —

Temp. of water 171°

Same rise as D-39 water a little too cold

D-41

Runs at 133°.
Rosin mix made by Mr Daly
Water circulation too cold and
too much clay in mix
Broke on extracting

D-42
Circulating water in tank 199°F
Mist same as D-39 - folded up
grab by hand,
Water temperature in tank is about
3° higher than jacks,
Print O.K. Smoothest yet

D43 Same as D42 except that temp of circulating water is at 206° in the tanks —

D-44 Temp of circulating water in tube 97° Cent.
Put label on by sticking it on the short pin for center hole - in the press the pin is forced thru.
O.K. but hole is a little rough and got some dirt on it,
Same mix as D-39

D-45 – Same as D-44 -

Same mixes as D-39 -

OK, except for slightly rough gate.

D46 - same proportions as D39

Screened the clay thru 70 mesh, pitched over all lac from clean looking shell lac from store room - instead of using the ground T.N. of previous experiments.

Dried chalk in steam oven for 5 hours after mixing the napthalene with it. All napthalene smell had disappeared so I put in fresh amount of 20g. on rolls

Chalk was screened thru 70 mesh screen.

Worked alone at night June 5 after Daily got thru and got mould too hot. stuck causing R.D. but I believe that general surface was improved by clean shellac -

D-47 –

Same material as D40 & D39 laid on steam plate and reheated – too stiff to print out,

Mould and bottom curved plate were hot and press cold –

Could not make the material into a job entirely free from creases –

D-48

300 g - H. M. Peabody (164) stiff -
50 g I. Rosin
40 g Naphthalene
10 g gas black
600 g china clay
1000 g -

Took off roll in 3/16 sheet - allowed to cool - heated up on hot plate balled up and pinched like Pathé.

Shellac seems too stiff and dry even more dry than D 47 but the gob was a little softer.

Try more rosin also more clay

D-49 June 8-18

300g TN
50g I Rosin
40g Naphthalene
10 g gas black
600 g china clay.

Mixed same as D-48 — too soft and sticky to take off rolls added about 75 g more clay

T.N. is much softer than the Peabody (164) stiff shellac —

N 1/16 piece of fiber between platter and mould to prevent too quick cooling — made same as D-48

Mould was too hot — stuck very badly and broke to pieces in taking off.

Broke showed crystals of X-naphthalene "mica" in the clay

Broke D 33 and it did not show the naphthalene crystals to the extent that this does but found some —

D-50 – Material of D-39 and some other scrap printed same as D-49 except did not have enough heat – did not stick but material was not quite soft enough.

D-51

250 g. H.W.P. Fine (Angelo's Amber)
75 g. I- Rosin
10 g. gas black
665 g. China clay.

Looks more dull than when mix contains Naphthalene

Condensed like leather on the hot plate - N.G.

C1017

D-52

25% 250 g shellac H.W.P. Fine –
10% 100 g Rosin –
10 g gas black –
640 g clay
1000 —

Came off rolls considerably softer than ~~D-51~~

Condensed on steam plate to rubber stage U.C.

D-53

250 g Shellac N.W.P. Fine –
50 g Rosin – I grade –
50 g Venice Turpentine –
10 g gas black
640 g clay (Kion)

1000

worked about the same as D52 possibly not quite so soft on rolls

D 54
200 gr shellac (4 WP. Fine)
130 g Rosin
10 gr gas black
660 g China clay dried.
carbine off rolls about like
D-52

D-55

36% 360 g shellac (H.W.P. Fine) (Reigabo Chemical)
10 g gas black
630 g china clay.
1000 g total —

Makes a stiff tough composition on the rolls — seems dry and crumbles on edges —

1-18 started June 11-18

July 15-18

*1 No 1 denat Alcohol
2 Solvent Naptha - softens, slightly. Boiling will not dissolve the Shellac a little alcohol added to the terps will dissolve the S.
*3 Turpentine. softens more than 2 the terps will dissolve the S.
4 Carbon Tetra chloride.
*5 Benzol.
*6 Camphor Oil. Boiling dissolves it, precipitates on cooling
7 Rosin Oil. Boiling in rosin oil has no effect
*8 China wood oil. boiling has no effect globules of shellac will not stick together in china wood oil
*9 Benzaldehyde Syn. Oil of bitter almonds. ~~Boiling has no effect~~
*10 Nitro Benzol. ~~Boiling has no effect~~
11 Cedar wood oil. Boiling has no effect
12 Eucalyptus oil. Boiling has no effect
*13 Palmitic acid. dissolves on boiling to clear liquid
*14 oil of amber. Boiling makes shellac rubbery and liquid turbid
15 Terebene. Shellac is sticky after boiling - solution turbid.
*16 Dichlor Ethane, Ethylene chloride.
17 Xylol. Shellac is rubbery after boiling.
18 Gasolene. Boiling has no effect

13 precipitates like a jelly on cooling
14 same effect as phenol

Shellac Liquid solvents

(D56)

Put 1g of shellac in a test tube with each solvent - on opposite page -

(1) Alcohol acts much quicker than any other.
(9) Oil of Bitter Almonds - (Synthetic) in more than twice the time dissolves about the same as alcohol - waxes settle to bottom that remain suspended in the alcohol.
(16) Dichlor Ethane - dissolves about the same as alcohol but a little slower than (9) waxes float on top of the liquid. Separates waxes perfectly.

(3) Turpentine softens shellac very slightly after 12 hours - surface very sticky.
(5) Benzol softens shellac and it sticks together in a tough rubbery mass after 12 hours - it is not at all sticky
(6) Camphor oil - after 12 hours - surface of flakes very soft and sticky but the flakes are still quite brittle.
(10) Nitro benzol softens shellac like dental rubber. not at all sticky and does not stick together as with Benzol (5)

C[illegible]

July 15-18

19 Amyl Acetate, softens shellac cold - dissolves on boiling
*20 Acetone
21 Toluol Softens cold - no effect on boiling.
22 Kerosene boiling has no effect
23 Formaldehyde Makes like rubber on boiling
*24 Chloroform
*25 Amyl alcohol Not as good as Ethyl -
*26 Petroleum ether ; bleaches shellac on boiling liquid remains white
*27 Acetic ether part dissolves a rotten jelly remains
28 acetic acid softens to a jelly on boiling - bleaches - shellac remains rotten jelly
*29 Bromine water
*30 Ammonia 29% complete solution after long time

26 leaves shellac tough and rubbery but not very soft

D56 cont

(20) Acetone dissolves shellac as quickly as alcohol -
(24) chloroform softens shellac to a jelly in a few minutes.
(27) Bleaches - softens to a jelly in a few minutes.
(29) Bromine water - bleaches.
(30) The shellac is made soft like rubber and the liquid turns a rich garnet color the shellac itself is bleached -

Mr. Edison's note –

Not solvents for shellac –

✓ Stearic acid with a little acetanilid to make more fluid. cheap – 30¢ lb

Mononitronaphthalene – its a solid cheap

Phenanthrene —— 75¢ lb

✓ Trichlorophenol – fairly cheap 1.00 lb

Monobrom camphor – good solvent liquid $\frac{1}{2}$.00

Quinidine good solvent

✓ Benzonaphthol good solvent very Horny cut –

✓ Quinine fine solvent 75¢ oz.

✓ Beta naphthol retinole – 1.50 lb.

✓ also acetanilid 1.00 lb.

Beter Napthol makes a tough substance like D-57 - (2)

Acetanilid " " " " " "

B Napthol " " " " " "

Hexadichlorethan "volatilizes" without melting – no effect –

Benzonapthol – makes a very tough material

Nitro napthalene mono-alpha, crystallizes out.

It takes a small quantity to make the shellac very soft, a smaller quantity seems to have no effect leaves shellac brittle crystalizes out in 36 hours – gets brittle on surface

Chloral Hydrate – no effect – still brittle –

dinitro chlor benzol – acts like 57 (2)

June 12-18

D-57 — Mr. Edison suggested mixing Trichlorophenol with shellac to soften it

(1) 5 g Trichlorophenol 10 g shellac – 33% when cold – soft like rubber packing –

(2) 2 g Trichlorophenol 8 g shellac 20% when cold about as soft as celluloid, but more brittle.

(3) 1 g. Trichlorophenol 9 g shellac 10% melting point considerably lowered and when cold is tougher than regular shellac –

Garnet lac acts the same as shellac

33% Trichlorophenol seems just as soft,

Thymol – acts like Trichlorophenol and requires a smaller amt for equivalent result.

Ortho Cresol, Meta, and para Cresol act like

– June 14-18 –

D-58

30%	300 g.	shellac H.W.P. (#164 Stiff) –
3%	30 g.	Trichloro phenol –
1%	10 g.	gas black –
66%	660 g.	china clay (Lion-Clay's Claytal)
	1000 g.	

very much softer than shellac alone – a little softer on the hot plate than the D-39 mixture. Made a good print but it broke in taking out of the ring ——

D-59- as D-58-

Same material heated up on hot plate and moulded again. stuck to mould and broke surface shows crystalization of the Trichlorphenol. just like the napthalene. \ This is "mica" in the day

D-60

60 g Trichlorophenol
540 g Shellac - 14 WP-164

Melted Trichlorophenol in an iron pan and gradually added shellac stirring constantly, was careful not to overheat the shellac.

Poured out in china dishes to cool -

Weighed out 330 g of above -
10 g gas black
660 g china clay
1000 g - to give exactly the same mix as D-58

Too much condensed on steam plate - made a very dry gob and a poor print.

D-61

243 g. shellac - HWP-164
27 g stearic acid -
60 g I Rosin -
10 g gas black -
670 g china clay
1000 g. -

Mixt on rolls - leaves the rolls cleaner than anything else previously tried

On steam plate - reduced to condense - so that it was no use to print -

D-62

250g NWP 164 shellac
50g I Rosin
50g Naphthalene
10g gas black
640g china clay (Lion)
1000g

Printed with same type of mould as Pathé mix. Gob seems too dry — mould may not have been hot enough.

D-63 same as 64

Same as D-62 except use T.N. Lac –

very little if any difference on the rolls – may be a little softer. —

same as 63

D-64 250g T.N. Lac –
50g I Rosin –
50g Stearic Acid –
10g gas black –
640g china clay – Lionclay
1000g total.

Very soft on rolls – leaves the rolls very clean —
Seems better on Rolls than any previous mixture

D-64 first print had moulds too cold
2d print bottom mould was too cold,

2d print was made of same material as the first – seemed as soft on 2d heating as first.

Heated a third time and was then softer than others except 65-

[redacted] D-65

Same as D-64 except garnet lac is used instead of T.N.

Softer and more sticky than D-64

Printed with moulds like Pathé first time mould holder was too small for mould - 2nd time did not have quite enough material - both came out O.K. as far as sticking is concerned

L1315

D-66 Varnish Exp —

Reg varnish 7 min viscocity add nearly equal volume of loose china clay, and a little alcohol — run thru paint mill twice —

Varnish 1 coat bake regular varnish 1 coat of reg 7 min visc varnish and bake again —

Moulds were injured by sulphur — apparently from the clay — also clay flakes split and caused a number of very small pull outs —

D-67 250g TNLac
50g I Rosin
60g Stearic Acid
10g gas black
630g China clay (Lion)
1000

~~very soft~~
left rocks very clean

Made a soft gob
apparently as soft as Pathé
Record OK on both sides —

C135-J

D-68

250 g TN Lac
60 g I Rosin
50 g stearic acid
10 g gas black
630 g china clay (Lion)
1000 g —

Aimed not so soft as D-67

Got softer than 67 and made a better print.
Wiped mould with paraffin — this makes rough cut since edge of mucic as it is all forced off of the label to the music

68-2 second print - did not use stearic acid —

D-69

250 g	TNLac
40 g	I Rosin
70 g	Stearic Acid
10 g	gas black
630 g	china clay (Lion)
1000	

very soft - but rotten cannot roll to pieces on rolls

very soft on steam plate - mixed a slimy gob - but very little difference between this and 67 and 68

69-1 did not have enough material to make the gob -

69-2 belt plant made so far

mould was carefully cleaned and ~~washed~~ with tanning solution - then cleaned with alcohol before 69-1

D 70

250g TN Lac
80g Rosin
30g Stearic Acid
10g gas black
630g china clay (Lions)

Very good consistency on rolls does not leave rolls quite as clean as when mix contains more stearic acid.

D-70-1 best print yet — several blisters developed in 3 hours.

D-70-2 made on brass kada moulds.

C413

D-71 Same as D-70 except use garnet Lac instead of T.N.

D-71-1 Seems to be about the same as 70-1
More blisters developed than in D-70-1

D-71-2 printed on a pair of brass cast moulds - one is very good - print is O.K.
More blisters develop than on D-70

[redacted] D-72

250g (164 Shellac)
50g I Rosin
50g Stearic acid
10g gas black
640g China clay (from bags)

went hard on rolls and came off in dry scales -

see D-73

Due to difference in clay

D-73

Same as D72 except use TN Lac and same as D-64 except that the old clay in bags in the store room is used instead of the Linn clay.

This acted exactly like D-72

53-73 inclusive made with Linn clay - which is more like tale does not contain grit but in microscope looks like fine mica. The old clay contains grit, but is very thoroly disintegrated and shows few of the mica scales.

D-74 China clay samples - Purchasing Dept

(1) Wm H. Schield W[illegible] 2500 letter June 3.
(2) K & B - No 10
(3) K & B No 10 A
(4) Klipstein
(5) Star washed) fine white — lumps - feels ~~coarse~~
(6) Dill Connett Inc
* (7) Refined No 1 Immaculate Kaolin Co
(8) K & M Clay Mines Edgar Co
(9) L.C. Clay " " "
(10) Charles Wagner Snowflake
(11) Charles Wagner S. Clay
(12) Dunn & Cruse P.M.C. not as fine as (9)
(13) Wm H. Schield - letter May 28
(14) Domestic No 37 W.H. White Ker
(15) Golding Bros
(16) Samuel Nevins Co 43 Clay
(17) K & B Terre Blanche
(18) Lion clay 3¢ lb
(19) Rotten Stone Chrystal - finer than any of the
(20) Kieselguhr - K. Co of Amer - California
Old Clay bought in bags from Schield
2d bag as fine as (7) or (9) —
bags bought in one lot by Brady

D-74. Microscope examination of Clays etc.

Micacious - particles - fine to .001
Mica " and lumps " .0001 to .001 mostly above .002
Mica " more lumps. .0001 to .003 " above .003 -
grit - Mica particles fine to .001 finer than (1)
~~a little finer than~~ to .002 Mostly above .003
a little finer than (5) with larger lumps,
a little finer than (4)
a little coarser than (2) but not so lumpy,
very fine average, but lumps and mica particles to .002
Coarse - mica particles to .004
About like (1) but more lumpy.
Very fine average - lumps - particles to .003
but more coarse particles.
About like No 1
Coarse grit and mica particles to .003
very coarse particles to .008
fine average but lumps & fibers like (10)
About like (4)
No large particles all below .002
Very fine needles - some as long as .006
one bag about like Lion Clay (18) and
both supposed to be the same three

D75
wear test
15 times shows no wear
25 times slight wear chipt side walls —
35 times considerable wear on side walls - chipt out. Bottom of groove O.K.
Sounds O.K.

(D75) 300g F.N. Lac
50g rosin
50g stearic acid
10g gas black
590g of old clay from 25 bag

Brady bought this from Wm. Schell at same time as the other clay that worked exactly like Lion clay —

fairly soft on rolls but not as soft as lion clay with only 250g of lac!

Made up on steam plate too stiff to ball up well but made as good a print as any

C151J

D-76 – Materials obtained in N.Y.

(1) Keystone Minerals Co. A-X Rotten stone air floated 30.00
(2) " " " Rotten stone dust – 35.00
(3) " " " #10 Mineral Black – 30.00
(4) King & Malsom Co. Rotten stone – 3¢
(5) " " " "Maleo" FFFF 2¢
(6) " " " Material #1 "Vellumite".
(7) Franco Amer Chem. Co. Extra Fine Rotten Stone Air floated #18.00
(8) " " " " No 1 Filler – #15.75
(9) K.F. Griffiths & Co. Rotten stone not air floated. #20.00
(10) Industrial Chem Co. Special Whiting (25.00)
(11) " " " Extra Light chalk 4¼¢ (1)
(12) " " " " " " 4¼¢ (2)
(13) " " " " " " Tyrone " (3)
(14) " " " V.G. Black (6¢)
(15) " " " Regular chalk –
(16) Franco Amer. Chem. Co. Black Filler – 14.50
(17) Wm H. Schmidt A.F. Filler 3¢ Aluminum "Flakes"
(18) " " " Barytes (35.00)
(19) " " " Infusorial Earth 3½¢
(20) Chas B Chrystal Rotten Stone.

D77 Materials obtained in N.Y.

(1) N.J. Zinc Co. – Florence White Seal 14¼ lc
(2) " " " " Green " 13¾
(3) " " " Standard 5% Boric B_2SO_4 10¼
(4) " " " Lehigh 35% " " 9¼
(5) " " " Standard Lt Lithopone 8¢
(6) Sieman & Elting Precip. Barium Sulphate 4¢
(7) Krebs Pigment & Chem Co. "Lowolite" 7¾ lc
(8) Clinchfield Products Corp. Barium Carbonate $65.00 ton
(9) " " " Blanc Fixe 80.00
(10) National Aniline & Chem Co. Precip chalk 5¼¢ ← 1111 = 10
(11) " " " " Magnesia Carbonate 11¢
(12) " " " Barium Carbonate
(13) " " " " Sulphate XX
(14) " " " " " XXX
(15) International Pulp Co Magnesium Silicate XX Superprade 2¢
(16) " " " " Tale AA1 grade 2¢
(17) L.A. Butler co Magnesia Oxide 7½ c
(18) " " " Light " " 40¢
(19) " " " Al Silicate 2¢
(20) ~~Wall~~ Manitee Fullers Earth $10.00 ton —

C155

D 78

Materials obtained in New York –

(1)	Union Tale Co.	2¢ lb.	all crystals – N.G. fine to .006
(2)	Talc Products Co	$9.00 ton – 1½¢ nominal price	not quite as minute fine as (1)
(3)	J. W. Coulston R. Burnt Umber	5¢ from Cyprus Island	V.V. fine like smoke rotten stone – fine looks a little like precip chalk. not so fine as Fix fine but has crystals –
(4)	" Capitol Brand Calcined Magnesia	9¢	
(5)	" 3 II 701 Barytes	2¢	
(6)	" L Golden Ochre	6¢ Terra Alba, Clay-Ceram.	
(7)	" A Indian Pinks	11¢ Barytes or Terra Alba-base	
(8)	" X95 Red	22¢ Barytes base –	
(9)	" B Drop Black	7¢ Coarse.	
(10)	" A Drop Black	8¢ Coarse.	
(11)	" Dry Blanc Fixe	5¢ VV. fine	
(12)	" C Burnt Umber	5¢: V.V. fine like (3)	Contains Manganese Oxide – used as drier also (3)
(13)	" BX Ochre	4¢. V.V. fine from Pa.	
(14)	" Aluminum Hydrate	16¢. V.V.V. fine – but lumps.	
(15)	Dunn & Kruse Rotten Stone	2½¢	
(16)	Residual from extraction of victor.		
(17)	Same Residual after roasting –		
(18)	Keystone Minerals Co. A-X Rotten stone.		
(19)	Clinchfield Products blanc Fixe.		
(20)	Blanc Fixe from 25 Cb bot.		

D 79

Materials obtained in New York

(1) E.M. & F. Waldo Blanc Fixe G4554 5½¢ Sold
(2) " "Basofor" 5½¢
(3) Marden, Orth & Hastings Blanc Fixe 5½¢ lost 4¢
(4) " " " Greensand biproduct (10.00)? ton -
(5) Gabriel & Schall Dry Blanc Fixe 4¼¢
(6) " " Lithopone 8½¢
(7) " " Barium Carbonate $70.00
(8) " " Barytes $35.00
(9) Whittaker Clark & Daniels Eng. washed clay. $34 $65.00
(10) Slate flour $225 — $17.50 from New England
(11) Terra Alba No 256 $22.50
(12) Kieselghur No 211 $40.00
(13) Tale No 4 $37.50
(14) Hammill & Gillespie Rotten Stone 4½ to 5¢
(15) " " Welch Terra Alba 1½¢ in bags
(16) " " M.D.C. Tale 2¢
(17) " " Lee moor Clay 2¾¢
(18) " " Silex 2¢
(19) Celite B.H.
(20) T.B. King. Wentworth Terra Alba, Nova Scotia $24.00 FOB Nova

V.V. fine
V.V.V. fine but has flake crystals
V.V. fine " " " " "
full of lumps of "asphine".
V.V. like a few flake crystals.
V.V.V. fine a few small flake crystals -
VVV fine
Coarse crystals
All mica
finer than (9) but all mica
V.V. fine but some clay flakes
Looks like 11 but not as fine
Crystals .006 - .008
about as fine as A X but not uniform.
Coarse "magnesia? asbestos?"
V.C. coarse crystals .008
plates of mica .006
fine - small flake crystals
clay crystals and infusorial spines.
Coarse crystals -

D-80.

%		
20.83⅓	250 g	Garnet Lac
4.16⅔	50 g	I Rosin
4.16⅔	50 g	Stearic Acid
.83⅓	10 g	Gas Heat
70.	840 g	AX Rotten Stone —
100%	1200 g —	

Cooked too long on rolls —

C16J

D81

.15%	210 g	Garnet Lac
.02857	40	I Rosin
.02857	40	Stearic Acid
.00714	10	Gray Black
.7857	100	Lithopone (Ponolith)
100.00	1400	

D82

300g garnet Lac.
20g I Rosin.
20 Stearic Acid.
10 gms black.
650 AX Rotten stone.

Too stiff on hot plate

D 83

280 g garnet Lac
20 g I Roam
40 g Stearic acid
10 g gas black
~~810 g~~ rotten Stone —

~~1160 total~~

Started with 650 rotten stone but had to add 160 g more rotten stone to get it off the rolls.

Softer than than D 82 —

Entirely too stiff on hot plate

D 84

250 g garnet Lac
17 g I Rosin
35 g stearic Acid
688 g AX Rotten Stone
10 g gas black
1000 g total —

like D-83 on rolls

Worked much softer on steam plate probably due to taking a shorter time on rolls —

200 cc AX Rotten Stone jolted down solid from 260 cc loose weighs 182 g.
125 cc water may be added without increasing its volume
100 cc added slowly and well mixed reduces volume to 175 cc

125 cc "Ponolith" weighs 150 g

300 g ponolith will fill the pores in 350 g rotten stone.

D85

230 g Garnet Lac
15 g I Borin
30 g Stearic Acid
10 g gas black
325 g Lithopone "Ponolith"
390 g AX Rotten Stone
1000 g total.

too stiff on steam plate. Should be made up richer and with rolls not so hot and then it could be removed so that it will be very soft on steam plate

C170

glass jar = 273g

D-86 Varnish Exp. —

268g regular varnish —
268g Lithopone —

Run thru small paint mill
very small amt of alcohol added
in paint mill to about replace
evaporation —

86-A — one coat reg thin 1 coat above
86-B — one coat of above then one coat reg
86-C — two coats of above

Painted 7/5/18
All good surface —

SOFT

D-87

Same proportion as 85 except that the stearic acid and resin is more ~~the~~ in proportion to the lac

190g - Garnet Lac
40g - Rosin
45g Stearic Acid
10g Gas Black
325g Lithopone
390g Rotten Stone
1000g total.

Soft on roll-
~~Softest yet~~ on steam plate
flowed out on mould
until no pin was left
around the edge -

Put Lithopone in first then
Rotten Stone

D-88

185 Garnet Lac
29 Rosin
44 Stearic Acid
10 Gas black
328 Lithopone
394 Rotten Stone - AX

Double amt made up 2000 g.

Lac - Rosin - Stearic Acid melted on rolls with Gas black - Lithopone mixed in well and then Rotten Stone added - Very soft on rolls - had to turn on water to get it off

Worked fine on hot plate and made a record apparently as good as the Master-mould is capable of making.

D-89

190 Garnet Lac.
35 Rosin.
40 Stearic Acid.
* 20 Gas black.
320 Lithopone.
390 Rotten Stone. AX
double Amt made up
not quite so rapt as rolls
as D88 —

See also D99

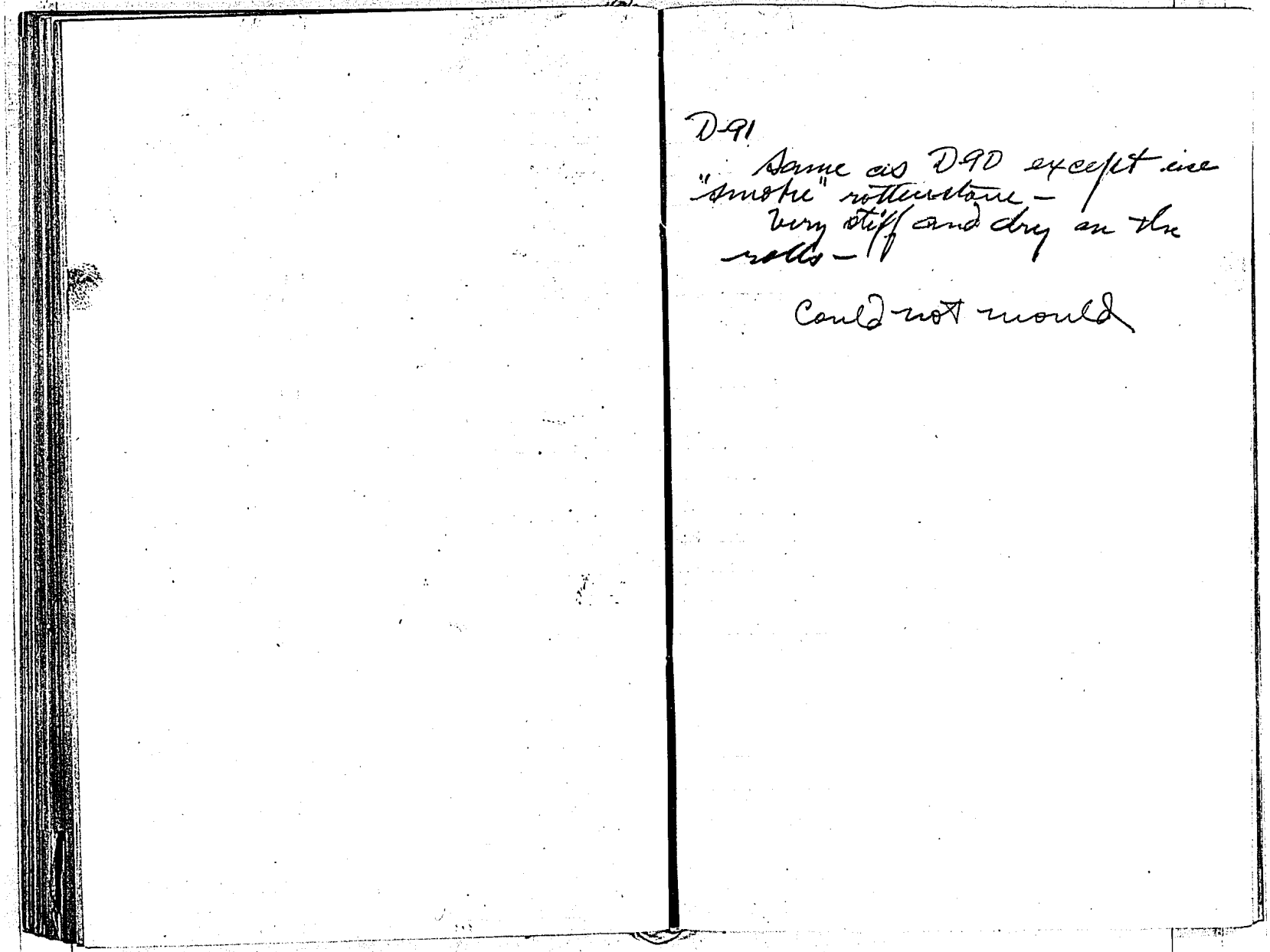
D-90-

350 g - H.W. Peabody & Co. shellac 2# 4 oz
XXTP No 3 Contract 1096.
10 gr = Gas black -
640 cg - Ax Rottenstone -

Very tough on rolls -
sticks to both rolls very badly.

Prints as good as 88 or 89
tho it is a little stiffer on
the steam plate II

See also D-100



D-91

Same as D90 except use "smoke" rotten stone —
very stiff and dry on the rolls — //

Could not mould

D-92 -

Weighed out material same as D-87 except used smoke nottumstage instead of AX
could not get all in without making material too stiff - 87 grams left - [redacted] of bentele batch - 346 gm. used.

Makes the softest surface yet but has bubbles and was too stiff to work well in printing.

D-93 Varnish Experiment.

glass jar weighs 273 grammes.

345g regular varnish 5 minutes viscosity.

345g "Panolith"

Put them on small paint mill added about 50 c.c. No 1 Denat Alcohol

Put on one coat very heavy then second coat regular varnish.

Sanded good but not much better than regular

D-94 Materials obtained in New York.

(1) C.P.N. Chemical Co. Inc. #1 Blanc Fixe
(2) " " " #2 Paris White
(3) " " " #3 Gilders whiting
(4) " " " #4 Extra Gilders Whiting
(5) " " " #5 Sublimed White Lead
(6) " " " #6
(7) " " " #7 Clay + Mica Cryst. coarse

(8) Innes Speiden China Clay No(1) all mica — looks like Talc — plates .003
(9) " " Clay No(2) fine but has mica has some grit.
(10) Thomas C. Dunham - whiting. fine crystals -
(11) Fuerst Bros Earth - E 8186. Mica and Mica - grit etc.
(12) C.J. Osborn Co. No1 Chalk 30cc Rotten - very fine -
(13) " " "S" Precipitated Chalk 5¢ free from grit -
(14) Clinchfield Products Blanc Fixe. V.V. fine has lumps and crystals — and flakes —
(15) 25 lb purchase - Blanc Fixe. V. fine -
(16) 25 lb purchase Barium carbonate - V.V. fine but has specks & Lumps
(17) N.J. Zinc "Florence White Seal" Zinc Oxide

See letter file 49

~~Clay~~ 20oo lbs

D 95

330 g soft flowing XXPP shellac
20 " stearic acid —
10 " gas black —
640 " AX Rotten stone —

Worked OK. on rolls but kept it on a little too long. Started to condense on steam plate - too stiff to make a full print.

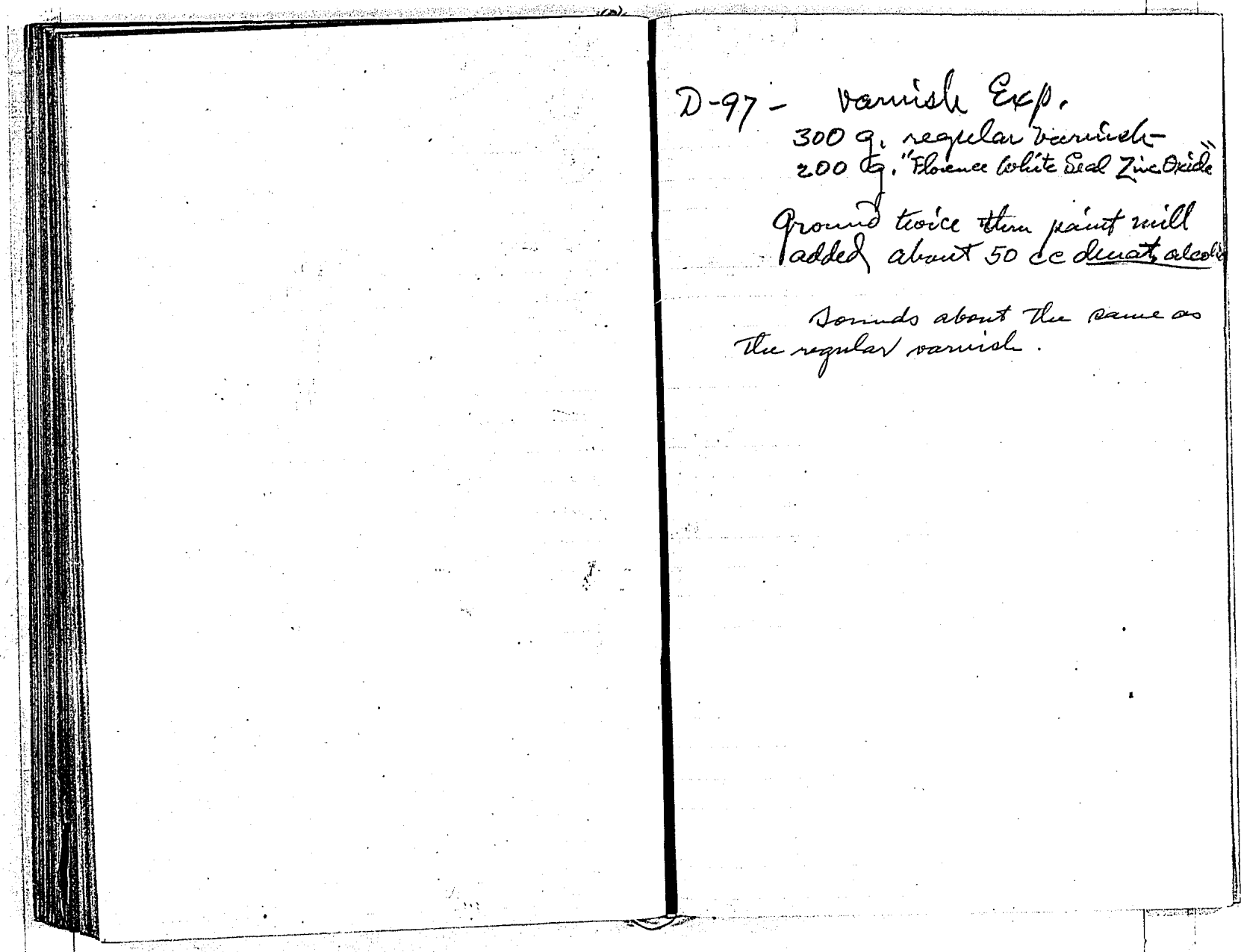
(1917)

D96

XKPP

360 g. 20% flowing shellac —
30 g. citaric acid —
10 " gas black —
600 " smoke rotten stone —

worked off on rolls —
printed on new moulds
quietest surface yet — got
was a little too stiff — but
made a good print



D-97 - Varnish Exp.

300 g. regular varnish -
200 g. "Florence White Seal Zinc Oxide"

Ground twice then paint mill added about 50 cc denat. alcohol

Sounds about the same as the regular varnish.

D-98 Varnish Exp.

288 g. Reg Varnish

288 g. Clinchfield Blanc Fixe.

Run thru paint mill twice

added about 50 c c alcohol

~~Made a beautiful print but few~~
~~bubbles spelled ruin~~ Dt.
~~Capt Edwards~~

Nearly all ~~were~~ poor prints.
Two surfaces out of 8 are O.K.
and sanded a little smoother
than the regular.

D-99 - Same material as D-89

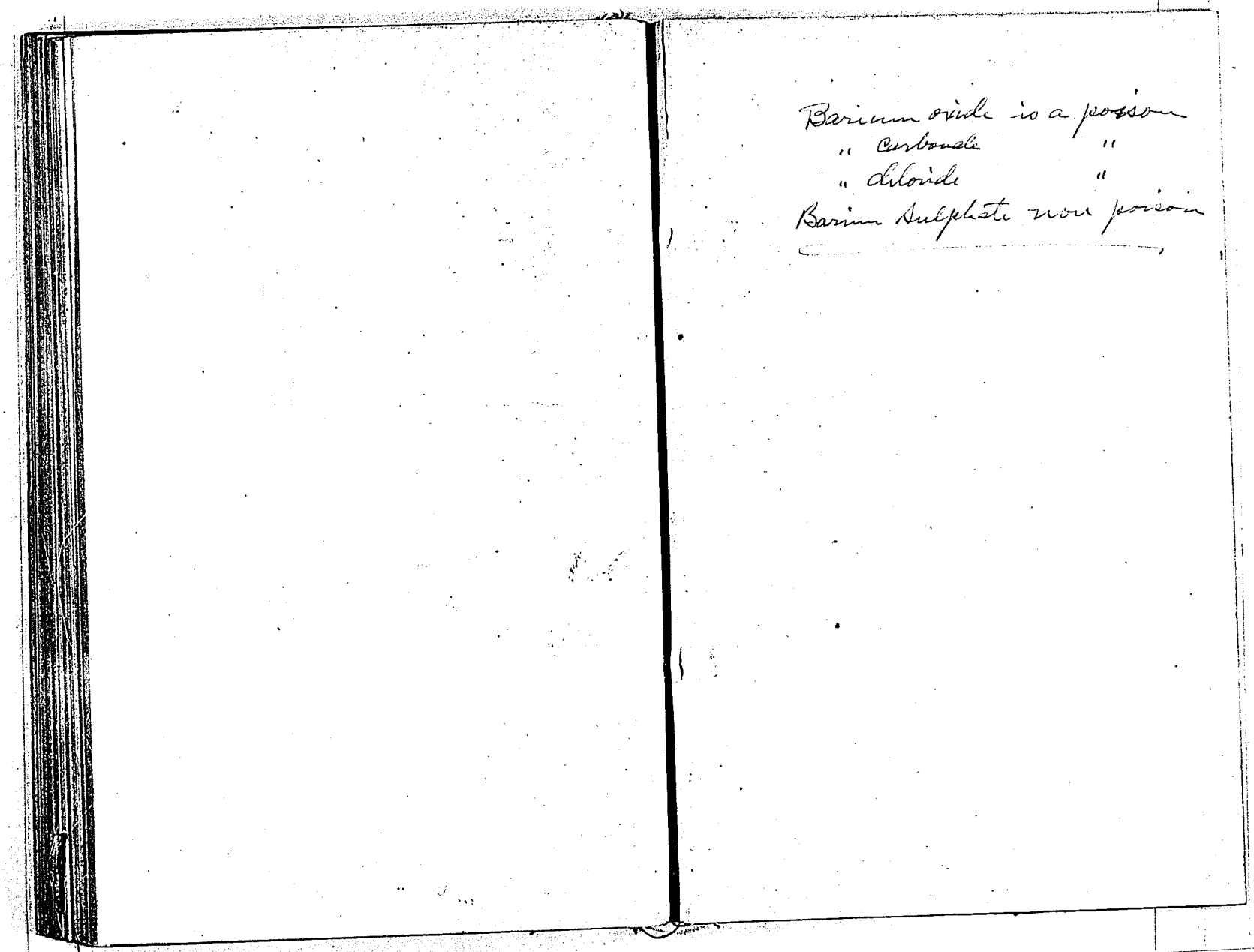
Made a beautiful print but bubbles swelled up in it from trapt air.

Same material as 88 gave same results -

D-100 Same material as D-90 - Made a fine print - used the material that squeezed out from D-90 to get enough - Very good consistency on 2d heating

Made two more prints both cracked in mould - These are the only prints I have had to crack -

C1997



Barium oxide is a poison
" Carbonate "
" chloride "
Barium Sulphate non poison